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OCP SEACON ALLIED MARINE CRANE ACCEPTANCE TESTS(U)

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TRACOR/MARINE INC FORT LAUDERDALE FL 11 APR 86

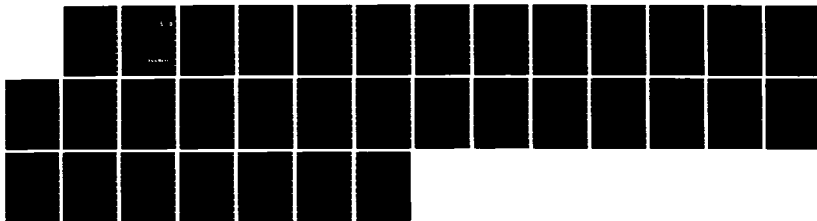
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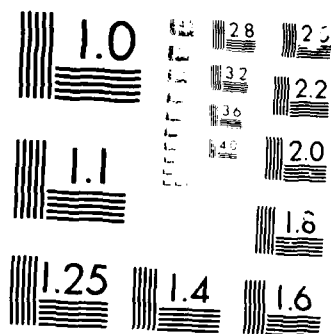
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N00600-85-D-0034

F/G 13/10

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OCP SEACON
ALLIED MARINE CRANE
ACCEPTANCE TESTS

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JUN 13 1986
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Prepared for:

Department of the Navy
Chesapeake Division
Naval Facilities Engineering Command
Building 212, Washington Navy Yard
Washington, DC 20374

Prepared by:

Tracor Marine, Inc.
P.O. Box 13107
Port Everglades Station
Fort Lauderdale, Florida 33316

Contract No. N00600-85-D-0834
Report No. 86-723610-1

11 April 1986

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Tracor Marine

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Tracor Marine

7a. NAME OF MONITORING ORGANIZATION

Ocean Engineering
& Construction
Project Office
CHESNAVFACENGCOM

6c. ADDRESS (City, State, and Zip Code)

P.O. Box 13107

Fort Lauderdale, FL 33316

7b. ADDRESS (City, State, and Zip)

BLDG. 212, Washington Navy Yard

Washington, D.C. 20374-2121

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Under Contract Number, N00600 85 D-0834, delivery order 010, Tracor Marine furnished and installed a new gantry crane and power pack for the OCF SEACON.

The crane and power pack were manufactured by Allied Systems Company (ASC),

Marine Crane Division, Portland, Oregon, under Tracor Marine purchase (Con't)

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Jacqueline B. Riley

DD FORM 1473, 84MAR

22b. TELEPHONE

202 433 3881

22c. OFFICE SYMBOL

SECURITY CLASSIFICATION OF THIS PAGE

BLOCK 19 (Con't)

orders 72420 and 72498, respectively. The orders were placed on 1 November 1985 and 4 December 1985 for the crane and power pack. The power pack was delivered to Tracor Marine by 28 February 1986. The crane was shipped from ASC on 20 March on two separate trucks, arriving at Fort Lauderdale on 24 and 25 March. The crane is designated ASC Model TB90-65 and carries serial number 1636. The system was installed aboard SEACON at the Tracor Marine Shipyard during the period 24 March through 1 April 1986 and accepted by CHESNAVFACENGCOM on 3 April 1986.

As part of the acceptance procedure, factory and post-installation field tests of the system were conducted in accordance with Tracor Marine specification 85 723605 5 and test criteria established on scene. The purpose of this report is present the results of the factory and field acceptance tests and to document any discrepancies.

Tracor Marine



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ALLIED MARINE CRANE
ACCEPTANCE TESTS

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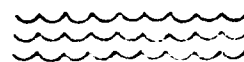
APPENDICES

- A Results of Factory Tests
- B Results of Field Tests

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Tracor Marine



1.0 INTRODUCTION

Under Contract Number, N00600-85-D-0834, delivery order 010, Tracor Marine furnished and installed a new gantry crane and power pack for the OCP SEACON. The crane and power pack were manufactured by Allied Systems Company (ASC), Marine Crane Division, Portland, Oregon, under Tracor Marine purchase orders 72420 and 72498, respectively. The orders were placed on 1 November 1985 and 4 December 1985 for the crane and power pack. The power pack was delivered to Tracor Marine by 28 February 1986. The crane was shipped from ASC on 20 March on two separate trucks, arriving at Fort Lauderdale on 24 and 25 March. The crane is designated ASC Model TB90-65 and carries serial number 1636. The system was installed aboard SEACON at the Tracor Marine shipyard during the period 24 March through 1 April 1986 and accepted by CHESNAVFACENGCOM on 3 April 1986.

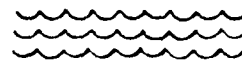
As part of the acceptance procedure, factory and post-installation field tests of the system were conducted in accordance with Tracor Marine specification 85-723605-5 and test criteria established on scene. The purpose of this report is to present the results of the factory (Section 2.0) and field (Section 3.0) acceptance tests and to document any discrepancies (Section 4.0).

2.0 FACTORY TESTS

Factory tests were conducted at the ASC Marine Crane Division facilities on 12 through 15 March 1986. The crane was mounted on a test stand. Test weights were provided by ASC. The tests were witnessed by the following personnel:

C.H. Sayler	ASC
J.D. Ghegan	ABS
J.N. Smith	CHESNAVFACENGCOM
W.L. Lane	Tracor Marine

Tracor Marine



The results of the factory tests are provided in Appendix A. No deficiencies were observed in the factory tests, although several tests were not conducted that were required to ascertain compliance with the specification; those tests were subsequently conducted during the field tests.

3.0 FIELD TESTS

The field tests were conducted immediately after installation of the system aboard SEACON during the period 2 to 3 April 1986. Certified concrete weights were used. Witnessing the tests were the following personnel:

C. Risener	ASC
J. Moore	ABS
H. Ackerman	CHESNAVFACENGCOM
L. Ryder	Tracor Marine
W. Lane	Tracor Marine

The results of the field tests are provided in Appendix B.

4.0 DISCREPANCIES

The Allied Marine Crane met or exceeded all the acceptance test criteria with the following exceptions:

<u>Specification</u>	<u>Test Performance</u>
Noise Level 85dBa (Section 3.5.4.1)	87-92 dBa
Minimum Hook Speed Under Rated Load of 30 fpm (Section 3.2.2)	20 fpm .

In addition, several other operational characteristics were noted. These include:

1. Noticeable vibration throughout the deck and simultaneous "groaning" when luffing with the rated load (44,000 pounds); and

Tracor Marine



2. A significant drop in engine rpm when a heavy lift was initiated. At the rated load, the rpm's dropped from 1800 to 1500. At the proof load (54,000 pounds), the rpm's dropped to 1100.

Mr. Richard Brecko of ASC indicated on 11 April 1986 that the first problem is common for a finely machined hydraulic ram and expects the vibration and noise to dissipate as the system is broken in. Further investigation is required into the second problem; ASC has agreed to look into the situation.

Also noted during the test period is a misalignment of the welded house break fixture on the pedestal relative to the mating lock on the rotating superstructure by 1" or so when the crane is in a fore and aft position, or at right angles to the outerline of the access hole (and the gantry). To make the house brake serviceable when securing the boom in the boom crutches, the fixture on the pedestal needs to be shifted approximately 5/8 inch. This can be accomplished by cutting off the horizontal plate (several inches away from the rotating components) offsetting it, and rewelding it, effectively lining up the holes to accept the locking bar.

5.0 CONCLUSION

The Allied Marine Crane installed aboard SEACON meets the procurement specifications with only minor exceptions, none of which materially degrade performance. Several other operational and installation problems were noted during the test period and action is being taken to resolve them.

Tracor Marine



APPENDIX A

Results of Factory Tests

Allied MARINE CRANE

A Division of Allied Systems Company

P.O. Box 23026, Portland, Oregon 97223 U.S.A

Telephone 503/625-2560 Telex 151731 ASC MARINE

ALLIED MARINE CRANE

PAGE 1 OF 4

FINAL TEST

MODEL: TB 90-65 SERIAL NO.: 1636 BY(Initial): CHS DATE: 3-14-86

INI/DATE

A) DATE CRANE MOUNTED ON TEST STAND 3-12-86 CHS /

B) DIMENSIONAL VERIFICATION

1. RETRACTED BOOM LENGTH, CL PIVOT TO LOAD
CL OF SHEAVE CASE 540 IN. CHS 3-15-86
2. EXTENDED BOOM LENGTH, CL PIVOT TO LOAD
CL OF SHEAVE CASE 780 IN. CHS/ 3-15-86
3. CLEARANCE BETWEEN BOTTOM OF BALLAST TANK 75 IN CHS/ 3-15-86
4. ANGLE OF BOOM TOP TO HORIZONTAL, MINIMUM 1.5° MAXIMUM 85° CHS/ 3-15-86

C) REEVING USED

1. 4 PARTS OF LINE 3/4 6 X 37 IWRC EIPS WIRE ROPE CHS/ 3-14-86
2. HOOK BLOCK MODEL 218 H-25 SWL 25 TON WT 660 LB. CHS/ 3-14-86

D) VERIFY THE FOLLOWING:

1. BOOM CYLINDER CLEARANCES WITH BOOM & TURRET CHS/ 3-12-86
2. ALL LUBRICATION POINTS GREASED PRIOR TO TEST CHS/ 3-12-86
3. ALL STRUCTURAL PINS, BOLTS, RETAINERS SECURED IN PLACE CHS/ 3-12-86
4. POWER PACK FLUID LEVELS (OIL, COOLANT, HYD. OIL, FUEL) ARE SATISFACTORY FOR TESTING: NOTE TANK LEVEL WHEN BOOM IS FULL EXTENDED AND UP. CHS/ 3-12-86
5. ELECTRICAL CABLES & CONNECTIONS ARE SECURE CHS/ 3-12-86
6. HYDRAULIC HOSES, TUBES & FITTINGS ARE SECURE CHS/ 3-12-86

E) BALLAST 22500 LB. (For Testing) CHS/ 3-12-86
31500 LB. (For operation)

MODEL TB 90-65 SER. NO. 1636

F) OPERATIONAL TESTS - SET ENGINE SPEED AT 1800 RPM

1. NO LOAD TEST

CHS / 3-14-86

a) LUFFING OPERATION

4 CYCLES-RAISE BOOM FROM 0⁰ TO MAXIMUM 75.7 SEC. (AVG)

LOWER BOOM FROM MAXIMUM TO 0⁰ 42.7 SEC. (AVG)

1 CYCLE- VARY THE LUFFING SPEED DURING CYCLE SO THAT THE
BOOM SLOWS TO ABOUT 20% OF SPEED BEFORE HITTING
STOPS ON RAISED & LOWERED POSITIONS.

CHS / 3-14-86

b) WINCHING OPERATION W/BOOM EXTENDED AND RAISED TO 80⁰

RAISE AND LOWER HOOK BLOCK THROUGH TRAVEL SPEED SPEEDS,
FROM MAXIMUM TO 0 SPEED, 3 CYCLES

CHS / 3-14-86

SET BOOM AT 45⁰ ANGLE, FULL EXTENDED;
MEASURE DISTANCE FROM ANTI-2-BLOCK WT.
TO TOP SURFACE OF TEST STAND BEAM 52'-7" FT.

1. HIGH SPEED WINCH SETTING, TIME RAISING 36.68 SEC.

TIME LOWERING 38.23 SEC.

2. LOW SPEED WINCH SETTING, TIME RAISING 70.73 SEC.

TIME LOWERING 72.75 SEC.

CHS / 3-14-86

c) ROTATION OPERATION 180⁰-HALF CYCLE
(DUE TO OBSTRUCTION NEAR TEST STAND)

RAISE BOOM IN FULL UP POSITION

2 CYCLE- 1. FULL SPEED, CLOCK WISE, 180⁰ 28.64 SEC. (AVG) 40.80 with Flow Restrictors

2 CYCLE- 2. FULL SPEED, CCW, 180⁰ 28.97 SEC. (AVG) 40.90 with flow restrictors

3. VARY SPEED FOR 3 HALF CYCLES, EACH DIRECTION

d) EXTENSION OPERATION (20 FT. STROKE)

3 CYCLE 1. TIME TO EXTEND 25.6 SEC. (AVG)

3 CYCLE 2. TIME TO RETRACT 32.3 SEC. (AVG)

2 CYCLE 3. VARY SPEEDS FROM MAXIMUM TO 0 FOR
EACH DIRECTION

CHS / 3-14-86

- e) DEMONSTRATE EMERGENCY ENGINE SHUT DOWN WORKS
(1 CYCLE ONLY)

CHS/ 3-14-86

- f) VERIFY THAT THE FOLLOWING ITEMS OPERATE:

1. DEFROST FAN
2. WINDOW WIPER
3. SMOKE ALARM
4. TEST BUTTON
5. DIMMER, PANEL
6. CAB LIGHT
7. HORN
8. HEATER/AIR CONDITIONER
9. POWER PACK GAGES
10. TACH GAGE (ACCURACY)
11. POWER PACK LIGHT
12. CAB OUTLET (120 VAC)

CHS/ 3-15-86

- g) KRUEGER SYSTEM

1. ANTI-2-BLOCK, WINCH
2. ANTI-2-BLOCK, EXTENSION
3. ANGLE INDICATOR SET $\pm 2^{\circ}$
4. LENGTH INDICATOR SET ± 1 FT.
5. LOAD-MOMENT INDICATOR IS OPERATIONAL
6. WINCH DOWN STOP

CHS/ 3-15-86

- h) NOISE TEST - SET ENGINE SPEED AT 1800 RPM

MEASURE NOISE LEVEL INSIDE THE CAB, WITH THE DOOR
CLOSED AND FLOOR PLATES IN PLACE, AND PANELS SET IN
PLACE ON THE POWER PACK. SET INSTRUMENT AT OPERATOR'S
HEAD LEVEL 81 DBA A-Weighting, Slow Response

INSTRUMENT USED Realistic, Cat. No. 42-3019 CHS/ 3-15-86

- i) SIMULTANEOUS OPERATION - SHOW THE FOLLOWING IN BOTH DIRECTIONS

1. SWING & BOOM
2. SWING & EXTEND
3. SWING & WINCH
4. BOOM & EXTEND
5. BOOM & WINCH
6. EXTEND & WINCH

CHS/ 3-15-86

- G) RATED LOAD TEST (REFERENCE TO LOAD CHART NO. 31090)

THIS IS A TEST USING A LIVE LOAD OF 44,000 LB., AS WAS AVAILABLE
TO THE FACTORY FOR THIS TEST.

1. SET WINCH SPEED ON SLOW SPEED AND ENGINE SPEED AT 1800 RPM.
SET BOOM EXTENSION IN FULLY RETRACTED POSITION.
2. WITH BOOM AT 3⁰, RAISE 44,000 LB. LOAD WITH LUFFING CYLINDERS TO 70⁰.
3. LOWER 44,000 LB. TO CAB LEVEL WITH WINCH.
4. SWING CRANE CLOCKWISE TO POSITION 15⁰ FROM FRONT OF TEST STAND.
SWING BACK TO BE NEAR IN LINE WITH TEST STAND.
5. EXTEND BOOM TO 65 FT.
6. LUFF BOOM TO 84⁰.
7. LOWER BOOM TO 70⁰.
8. RETRACT BOOM EXTENSION FULLY IN.
9. WINCH LOAD UP TO WITHIN 15 FT. OF SHEAVE CASE.
10. LOWER BOOM TO SET LOAD BACK IN ORIGINAL LOCATION.

RELIABILITY TESTS: REPEAT 2 THRU 10 FOR 40 CYCLES.

H) LATERAL LOAD - 5⁰ LIST EQUALS 3,850 LBS HORIZONTAL WITH
44,000 LB LOAD AT 45 FT. LOAD RADIUS.

WITNESS, ASC CHS / 3-14-86

I) PROOF TEST CRANE: THE TEST OF STATICALLY HOLDING A LOAD AT 5 TON
(10,000) LB ABOVE THE RATED LOAD (PER ABS). Boom 0⁰, 45 Ft.R., Retracted;
Boom 48⁰, 45 ft. R., Extended, Rated Load 32,000, Test 40,000;
Boom 0⁰, 65 Ft. R., Extended, Rated Load 27,000, Test 34,000

ASC Chris H. Sayler
Chris H. Sayler

Signature

3/15/86

Date

ABS J.D. Ghagan
J.D. Ghagan

Signature

14 MAR 86 * 86 P011633-

508 3-14-86

CUSTOMER WITNESS [Signature]

Signature

Signature

Tracor Marine



APPENDIX B

Results of Field Tests

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PRESENTED TO
GEO. PHILIPS-CHESDIV

ACCEPTANCE TEST PLAN

ALLIED CRANE MODEL TB 90-65S

1.0 INITIAL PREPARATIONS

After reassembly and installation of crane by shipyard, the Allied factory representative shall determine that all components are correctly hooked up and functioning correctly. This shall include, but not be limited to, engine performance, hydraulic pumps, and hose connections to matching control circuits. When the crane is fully checked out including filling the hydraulic reservoir, fuel tank and radiator, testing shall commence.

2.0 NO LOAD OPERATION TEST

The crane shall be required to function through full operating ranges in all directions specified for the equipment. During the test, operation of the limit switches, emergency stops and limit device recovery features shall be demonstrated.

2.1 Luffing Operation

2.1.1 Set engine speed at 1800 RPM.

4 cycles - Raise boom from 0° to maximum 25.37 SEC (AVG)
Lower boom from maximum to 0° 47.16 SEC (AVG)

WFF 1/4/2

1 cycle - Vary the luffing speed during cycle so that the boom slows to about 20% of speed before hitting stops on raised and lowered positions.

OK WSL / 4/2

2.2 Winching Operation

2.2.1 Raise boom to 80° and extend boom to 65 feet.

3 cycles - Raise and lower hook block through full range of travel at speeds varying from 0 to maximum (high speed setting).

OK WSL / 4/2

Demonstrate anti-two-block operation.

OK WSL / 4/2

2.2.2 Lower boom to 45° angle, fully extended. Measure distance from anti-two-block weight to deck surface. 44.33 FT.

2 cycles - High speed winch setting,

(75 FPM) Time raising 35.46 SEC (AVG)

(76.1 FPM) Time lowering 34.94 SEC (AVG)

2 cycles - Low speed winch setting,

(38.76 FPM) Time raising 69.15 SEC (AVG)

(40.12 FPM) Time lowering 66.30 SEC (AVG)

1 cycle - Lower boom to 0° and swing boom to starboard quarter. Pass block to forklift on dock. Veer winch wire while forklift is carrying block until approximately 3 wraps of wire are left on winch drum. Check that the "down stop" mechanism shuts off winch. Stop forklift travel at same time.

OK WSL / 4/2

2.3 Rotation

Raise boom to 45°, fully extended

3 cycles - Rotate through 360° at varying speeds from zero to maximum (clockwise)

3 cycles - Repeat operation in counter clockwise direction.

(1.08 RPM) 2 cycles - At full speed, rotate CW 360° 55.50 SEC(AVG)

(1.05 RPM) 2 Cycles - At full speed, rotate CCW 360° 57.12 SEC(AVG)

DR / 4/3/86

2.4 Boom Extend

Raise boom to maximum angle.

3 cycles - Time to extend, maximum speed 56.81 SEC(AVG)
Time to retract maximum speed 56.67 SEC(AVG)

2 cycles - Vary speeds from maximum to zero for each direction.

DR / 4/3/86

2.5 Emergency Stop

Demonstrate emergency engine shutdown by depressing emergency shutdown button, after reducing engine speed to 1000 rpm.

Did not accomplish fully as required DR / 4/3/86

2.6 Verification of Auxiliary Items

2.6.1

1. ✓ Defrost Fan
2. ✓ Window Wiper
3. ✓ Smoke Alarm
4. ✓ Test Button
5. ✓ Dimmer, Panel
6. (6) Cab Light (120 V) TO BE CHANGED TO 12 VDC

7. Horn (120 V) *TO BE CHANGED TO 12 VDC*
8. ✓ Heater/Air Conditioner
9. ✓ Power Pack Gages
10. Tach Gage (Accuracy) *did not compare*
11. ✓ Power Pack Light
12. Cab Outlet (120 VAC) *NOT HOOKED UP* *OK 4/3/86*

2.6.2 Krueger System

1. ✓ Anti-2-Block, Winch *Failed one hoist test*
2. Anti-2-Block, Extension ✓
3. ✓ Angle Indicator Set $\pm 2^\circ$
4. ✓ Length Indicator Set ± 1 Ft.
5. ✓ Load-Moment Indicator is Operational
6. ✓ Winch Down Stop
Pulled wire off drum with crane *OK 4/3/86*

2.7 Simultaneous Operation

Show the following in both directions:

1. ✓ Swing & Boom
 2. ✓ Swing & Extend
 3. ✓ Swing & Winch
 4. ✓ Boom & Extend
 5. ✓ Boom & Winch
 6. ✓ Extend & Winch
- OK 4/3/86*

2.8 Noise Test

Set engine speed at 1800 RPM.

Measure noise level inside the cab, with the door closed and floor plates in place, and panels set in place on the power pack. Set instrument at operator's head level 87-92 DBA

Instrument Used REALISTIC - 332050
ROAD SHACK

OK 4/3/86

3.0 LOAD TEST

3.1 Proof Load Test ABS Approval

This test shall conform to ABS requirements per "Certification of Construction and Survey of Cargo Gear on Merchant Vessels", ABS-1975.

The proof load shall be 5 tons in excess of working load; or

44000 pounds SWL + 10000 pounds = 54000 pounds

Subject to the approval of the local surveyor the tests shall be conducted as follows:

3.1.1 Boom Horizontal - Maximum Radius

1. With the boom horizontal, and the boom extension retracted, lower the hook block and secure to the test load.
2. Hoist the load clear of all obstructions and rotate crane clockwise ~~one~~ ^{1/2} revolution at 1/3 speed.
3. Rotate crane ~~one~~ ^{1/2} revolution counter clockwise at 1/3 speed.

3.1.2 Boom Elevated - Minimum Radius

1. Raise boom (extension still retracted) to angle of 59 degrees with load on hook.
2. Lower load to deck (distance from crane centerline is 25 feet) and release hook.

3. Raise boom to 70° angle and extend boom to full length of 65 feet.
4. Lower hook block and engage hook with test load.
5. Hoist the load clear of all obstructions and rotate crane clockwise ~~one~~ ^{1/2} revolution at 1/3 speed.
6. Rotate crane ~~one~~ ^{1/2} revolution counter clockwise at 1/3 speed.
7. Lower test load to deck.

~~WITNESS, ASC~~ _____ ~~ABS OBSERVER~~ _____

PROOF TEST OF CRANE: THE TEST OF STATICALLY HOLDING A LOAD AT 5 TON (10,000) LBS. ABOVE THE RATED LOAD (PER ABS).

ASC Chuck Risener

Chuck Risener

Signature

4-3-86

Date

✓ ABS Jack E. Moore

Jack E. Moore

Signature

2 April 1986

Date

CUSTOMER WITNESS

Leon E. Ryder

Leon Ryder (Tracor)

2 April 1986

Date

William L. Lane

William L. Lane (Tracor)

2 April 1986

Date

3.2 Rated Load Test

3.2.1 Sequential Operation

1. ✓ Adjust test load to 44,000 pounds. *(3 blocks of concrete total 44k)*
2. ✓ Lower boom to 3° elevation with boom retracted.
3. ✓ Secure hook block to test load.
4. ✓ Raise 44000 pound test load with luffing cylinders to 70°.
5. ✓ Bring test load to cab level with winch.
6. ✓ Rotate crane clockwise 180°. Swing back 180°. Note: Load must clear all obstruction while swinging.
7. ✓ Extend boom to 65 feet.
8. ✓ Luff boom to 84°. *75° load would strike runs at 84°*
9. ✓ Lower boom to 70°
10. ✓ Retract boom extension fully in. *brought to 65° as load would strike runs*
11. ✓ Winch load up to within 15 feet of sheave case.
12. ✓ Lower boom to 3°. *(over Quay wall)*

NOTE: RAISED TEST LOAD WITH LOW SPEED WINCH SETTING THROUGH
DISTANCE OF 20 FEET IN 60 SECONDS

$$\text{RATE OF TRAVEL} = \frac{20 \times 60}{60} = 20 \text{ FPM.}$$

Repeat Steps 4 through 13 for 5 cycles.

3.2.2 Lateral Load *

Shift ballast and list ship 5° to starboard. With the boom horizontal and the boom extension fully retracted secure the hook to the load on the deck.

Hoist the load high enough to clear all obstructions and rotate clockwise, stopping momentarily when the boom is over the starboard beam. Resume clockwise, turn 90° stopping when boom is fore and aft to demonstrate brake holding and start up. Continue clockwise 180° to original position and lower load to deck.

* NOTE: THIS TEST DELETED PER HARRY ACKERMAN (CHES DIV) - 4/3/86
DUE TO DOCKSIDE OBSTRUCTIONS & ONGOING ACTIVITIES. HJO

3.3 Gantry Travel

Mark off ~~60~~⁵⁰ feet along the track, allowing 10 feet or more on each end for slowing and accelerating the gantry.

Lower boom to 3° with the extension fully retracted.

Secure hook to test load of 44,000 pounds.

Position boom so as to clear all obstacles on deck when gantry is in extreme positions, both fore and aft.

Set independent power pack for 1800 rpm.

Move control stick to full speed, bring gantry up to speed and time the speed between the marks.

(40.8 FPM) 2 cycles - Time to move gantry aft 73.5 SEC(AVG)
(38.46 FPM) Time to move gantry fwd 78 SEC(AVG)

2 cycles - Vary speeds from maximum to zero for each direction.

Test plan prepared by: W.L. Lane
Date: 31 March 1986

*WITH EXCEPTIONS TAKEN AS NOTED:
ACCEPTANCE TESTS * NO 1. DBA AVG. 89.5 VICE 85
2. HOOK SPEED W/RATED LOAD WAS 20 FPM VICE 30 FPM

ASC Chuck Risener

Chuck Risener
Signature

4-3-86
Date

CUSTOMER WITNESS

Harry Ackerman (CHESDIV)

✓ H. Ackerman
Signature

4/4/86

Leon Ryder (Tracor)

✓ Leon Ryder
Signature

3 April 1986

William L. Lane (Tracor)

✓ William L. Lane
Signature

3 April 1986

ACCEPTANCE TEST PLAN

ALLIED CRANE MODEL TB 90-65S

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After reassembly and installation of crane by shipyard, the Allied factory representative shall determine that all components are correctly hooked up and functioning correctly. This shall include, but not be limited to, engine performance, hydraulic pumps, and hose connections to matching control circuits. When the crane is fully checked out including filling the hydraulic reservoir, fuel tank and radiator, testing shall commence.

2.0 NO LOAD OPERATION TEST

The crane shall be required to function through full operating ranges in all directions specified for the equipment. During the test, operation of the limit switches, emergency stops and limit device recovery features shall be demonstrated.

2.1 Luffing Operation

2.1.1 Set engine speed at 1800 RPM.

4 cycles - Raise boom from 0° to maximum 75.37 SEC (AVG)
Lower boom from maximum to 0° 47.16 SEC (AVG)

WTH 1/1/8

1 cycle - Vary the luffing speed during cycle so that the boom slows to about 20% of speed before hitting stops on raised and lowered positions.

OK WSH / 4/2

2.2 Winching Operation

2.2.1 Raise boom to 80° and extend boom to 65 feet.

3 cycles - Raise and lower hook block through full range of travel at speeds varying from 0 to maximum (high speed setting).

OK WSH / 4/2

Demonstrate anti-two-block operation.

OK WSH / 4/2

2.2.2 Lower boom to 45° angle, fully extended. Measure distance from anti-two-block weight to deck surface. 44.33 FT.

2 cycles - High speed winch setting,

(75 FPM) Time raising 35.46 SEC (AVG)

(76.1 FPM) Time lowering 34.94 SEC (AVG)

2 cycles - Low speed winch setting,

(38.76 FPM) Time raising 69.15 SEC (AVG)

(40.12 FPM) Time lowering 66.30 SEC (AVG)

1 cycle - Lower boom to 0° and swing boom to starboard quarter. Pass block to forklift on dock. Veer winch wire while forklift is carrying block until approximately 3 wraps of wire are left on winch drum. Check that the "down stop" mechanism shuts off winch. Stop forklift travel at same time.

OK WSH / 4/2

2.3

Rotation

Raise boom to 45°, fully extended

3 cycles - Rotate through 360° at varying speeds from zero to maximum (clockwise)

3 cycles - Repeat operation in counter clockwise direction.

(1.08 RPM) 2 cycles - At full speed, rotate CW 360° 55.50 SEC(AVG)

(1.05 RPM) 2 Cycles - At full speed, rotate CCW 360° 57.12 SEC(AVG)

PR / 4/3/86

2.4

Boom Extend

Raise boom to maximum angle.

3 cycles - Time to extend, maximum speed 56.81 SEC(AVG)
Time to retract maximum speed 56.67 SEC(AVG)

2 cycles - Vary speeds from maximum to zero for each direction.

PR / 4/3/86

2.5

Emergency Stop

Demonstrate emergency engine shutdown by depressing emergency shutdown button, after reducing engine speed to 1000 rpm.

Did not accomplish fully as required PR 4/3/86

2.6

Verification of Auxiliary Items

2.6.1

1. ✓ Defrost Fan

2. ✓ Window Wiper

3. ✓ Smoke Alarm

4. ✓ Test Button

5. ✓ Dimmer, Panel

6. Cab Light (120 V) TO BE CHANGED TO 12 VDC

7. (7.) Horn (120 V) *TO BE CHANGED TO 12 VDC*
8. ✓ Heater/Air Conditioner
9. ✓ Power Pack Gages
10. (10.) Tach Gage (Accuracy) *did not compare*
11. ✓ Power Pack Light
12. (12.) Cab Outlet (120 VAC) *NOT HOOKED UP* *PK 4/3/86*

2.6.2

Krueger System

1. ✓ Anti-2-Block, Winch *— Failed one hoist test*
2. (2.) Anti-2-Block, Extension ✓
3. ✓ Angle Indicator Set $\pm 2^{\circ}$
4. ✓ Length Indicator Set ± 1 Ft.
5. ✓ Load-Moment Indicator is Operational
6. ✓ Winch Down Stop
Pulled wire off drum with crane *PK 4/3/86*

2.7

Simultaneous Operation

Show the following in both directions:

1. ✓ Swing & Boom
2. ✓ Swing & Extend
3. ✓ Swing & Winch
4. ✓ Boom & Extend
5. ✓ Boom & Winch
6. ✓ Extend & Winch

PK 4/3/86

2.8

Noise Test

Set engine speed at 1800 RPM.

Measure noise level inside the cab, with the door closed and floor plates in place, and panels set in place on the power pack. Set instrument at operator's head level 87-92 DBA

Instrument Used REALISTIC - 332050
RADIO SHACK

PK 4/3/86

3.0 LOAD TEST

3.1 Proof Load Test ABS Approval

This test shall conform to ABS requirements per "Certification of Construction and Survey of Cargo Gear on Merchant Vessels", ABS-1975.

The proof load shall be 5 tons in excess of working load; or

44000 pounds SWL + 10000 pounds = 54000 pounds

Subject to the approval of the local surveyor the tests shall be conducted as follows:

3.1.1 Boom Horizontal - Maximum Radius

1. With the boom horizontal, and the boom extension retracted, lower the hook block and secure to the test load.
2. Hoist the load clear of all obstructions and rotate crane clockwise ~~one~~ $\frac{1}{2}$ revolution at $\frac{1}{3}$ speed.
3. Rotate crane ~~one~~ $\frac{1}{2}$ revolution counter clockwise at $\frac{1}{3}$ speed.

3.1.2 Boom Elevated - Minimum Radius

1. Raise boom (extension still retracted) to angle of 59 degrees with load on hook.
2. Lower load to deck (distance from crane centerline is 25 feet) and release hook.

3. Raise boom to 70° angle and extend boom to full length of 65 feet.
4. Lower hook block and engage hook with test load.
5. Hoist the load clear of all obstructions and rotate crane clockwise ~~one~~ ^{1/2} revolution at 1/3 speed.
6. Rotate crane ~~one~~ ^{1/2} revolution counter clockwise at 1/3 speed.
7. Lower test load to deck.

~~WITNESS, ASC~~ _____ ~~ABS OBSERVER~~ _____

PROOF TEST OF CRANE: THE TEST OF STATICALLY HOLDING A LOAD AT 5 TON (10,000) LBS. ABOVE THE RATED LOAD (PER ABS).

ASC Chuck Risener

Chuck Risener

Signature

4-3-86

Date

✓ ABS Jack E. Moore

Jack E. Moore

Signature

2 April 1986

Date

CUSTOMER WITNESS

Leon E. Ryder

Leon Ryder (Tracor)

2 April 1986

Date

William L. Lane

William L. Lane (Tracor)

2 April 1986

Date

3.2 Rated Load Test

3.2.1 Sequential Operation

1. ✓ Adjust test load to 44,000 pounds. *(3 blocks of concrete total 44K)*
2. ✓ Lower boom to 3° elevation with boom retracted.
3. ✓ Secure hook block to test load.
4. ✓ Raise 44000 pound test load with luffing cylinders to 70°.
5. ✓ Bring test load to cab level with winch.
6. ✓ Rotate crane clockwise 180°. Swing back 180°. Note: Load must clear all obstruction while swinging.
7. ✓ Extend boom to 65 feet.
8. ✓ Luff boom to 84°. *75° load would strike rams at 84°*
9. ✓ Lower boom to 70°
10. ✓ Retract boom extension fully in. *brought to 65° as load would strike rams*
11. ✓ Winch load up to within 15 feet of sheave case.
12. ✓ Lower boom to 3°. *(over Quay wall)*

NOTE: RAISED TEST LOAD WITH LOW SPEED WINCH SETTING THROUGH
DISTANCE OF 20 FEET IN 60 SECONDS
RATE OF TRAVEL = $\frac{20 \times 60}{60}$ = 20 FPM.

Repeat Steps 4 through 13 for 5 cycles.

3.2.2 Lateral Load *

Shift ballast and list ship 5° to starboard. With the boom horizontal and the boom extension fully retracted secure the hook to the load on the deck.

Hoist the load high enough to clear all obstructions and rotate clockwise, stopping momentarily when the boom is over the starboard beam. Resume clockwise, turn 90° stopping when boom is fore and aft to demonstrate brake holding and start up. Continue clockwise 180° to original position and lower load to deck.

* NOTE: THIS TEST DELETED PER HARRY ACKERMAN (CHES DIV) - 4/3/86
DUE TO DOCKSIDE OBSTRUCTIONS & ONGOING ACTIVITIES. HJO

3.3 Gantry Travel

Mark off ~~60~~⁵⁰ feet along the track, allowing 10 feet or more on each end for slowing and accelerating the gantry.

Lower boom to 3° with the extension fully retracted.

Secure hook to test load of 44,000 pounds.

Position boom so as to clear all obstacles on deck when gantry is in extreme positions, both fore and aft.

Set independent power pack for 1800 rpm.

Move control stick to full speed, bring gantry up to speed and time the speed between the marks.

(40.8 FPM) 2 cycles - Time to move gantry aft 73.5 SEC(AVG)
(38.46 FPM) Time to move gantry fwd 78 SEC(AVG)

2 cycles - Vary speeds from maximum to zero for each direction.

Test plan prepared by: W.L. Lane

Date: 31 March 1986

ACCEPTANCE TESTS *

* WITH EXCEPTIONS TAKEN AS NOTED:

NB 1. DBA AVG. 89.5 VICE 85

2. HOOK SPEED W/RATED LOAD WAS 20 FPM VICE 30 FPM

ASC Chuck Risener

Chuck Risener

Signature

4-3-86

Date

CUSTOMER WITNESS

Harry Ackerman (CHESDIV)

✓ *H. Ackerman*

Signature

4/4/86

Leon Ryder (Tracor)

✓ *Leon Ryder*

Signature

3 April 1986

William L. Lane (Tracor)

✓ *William L. Lane*

Signature

3 April 1986

END

DTIC

7-86